

HW 11

$$1) \quad x^3 - 9x - 28 = 0$$

$$x = u + v$$

$$(u+v)^3 - 9(u+v) - 28 = 0$$

$$u^3 + v^3 + 3uv(u+v) - 9(u+v) - 28 = 0$$

$$u^3 + v^3 +$$

$$2) \quad x^3 - 30x - 133 = 0$$

$$x = u + v$$

$$(u+v)^3 - 30(u+v) - 133 = 0$$

$$u^3 + v^3 + 3uv(u+v) - 30(u+v) - 133 = 0$$

$$3) \quad x^3 + px + q = 0$$

$$u^3 + v^3 + (u+v)(3uv+p) + q = 0$$

$$u^3 + v^3 = -q$$

$$u^3 + v^3 = -p^3/27$$

$$t^2 + qt - p^3/27$$

$$u^3 = \frac{-q}{2} + \sqrt{\frac{q^2}{4} + \frac{p^3}{27}} \quad v^3 = \frac{-q}{2} - \sqrt{\frac{q^2}{4} + \frac{p^3}{27}}$$

$$27q^2 + 4p^3 < 0$$

$$x^3 + x^2 - 2 = 0$$

$$4) \quad x^3 + 3x^2 + 5x - 100 = 0$$

$$x = \left[y - \frac{b}{3a} \right]$$

$$\left(y - \frac{b}{3a} \right)^3 + 3 \left(y - \frac{b}{3a} \right)^2 + 5x - 100 = 0$$